

ITD

USER MANUAL



TEKRON

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1 Introduction

The Isolated Timing Distributor (ITD) is designed to distribute IRIG-B signals and/or Pulses for use in synchronizing industrial control and SCADA equipment. The ITD is ideally suited to distribution of signals to multiple racks due to the isolation between all interfaces.

Each input and output of the ITD is isolated from earth and every other output, so that attached wiring can feed out to operating areas in different earth potential zones without compromising the overall site earthing security. In addition, isolation and transient suppression devices protect the internal electronics from longitudinal and transient voltages.

The ITD is supplied complete with all hardware required for installation, including rack-mount kit and connectors.



Figure 1 – Isolated Timing Distributer front panel

The front panel of the ITD features two LED indicators which indicate the current status of the unit.

1. The PWR LED is illuminated when power is on
2. The SIG LED flashes in sync with data transmission.

2 Back Panel – Inputs and Outputs

ITD back panels are shown in 2 & 3. The only difference between fiber and other interfaces is the type of connector used. An ST fiber connector is used for fiber outputs and a 2 pin, 5.08 mm connector for all other outputs.



Figure 2 – Rear panel of ITD, configured with four TTL outputs



Figure 3 – Rear panel of ITD, configured with four fiber outputs

Modular Inputs

There are two input types that the ITD can be configured with. They are:

Output Type	Features
TTL	TTL (5 V, 2 mA), 4-pin 5.08 mm connector.
Fiber	ST fiber connector, compatible with 50/125 μm , 62.5/125 μm and 100/140 μm glass fiber.

Table 1 – ITD Available Input Modules

P2: Input Connector (4-pin [5.08 mm] or ST Fiber)

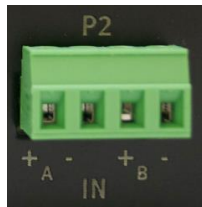


Figure 4 – 4-pin input connector

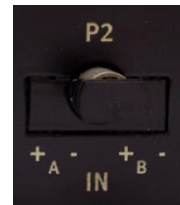


Figure 5 – Fiber input connector

The 4-pin connector is divided into 2 halves with the input on section 'A' and a 120 Ω termination on section 'B'. The polarity of the inputs is indicated by the '+' and '-' symbols on the back panel. TTL inputs are galvanically isolated from power, logic and outputs.

TTL inputs use a resistor to limit the current to 2 mA at 5 V with an input range of 5 – 12 V. In order to terminate the input, simply place a shorting link between the two pins of 'B'.



Note that only the last unit on the signal line should be terminated.

Modular Outputs

Output Type	Features
TTL	TTL (5 V, 2 mA), 4-pin 5.08 mm connector.
Fiber	ST fiber connector, compatible with 50/125 μm , 62.5/125 μm and 100/140 μm glass fiber.

Table 2 – ITD Available Output Modules

P3 – P6: Output Connectors (2-pin [5.08 mm] or ST fiber)



Figure 6 – 2-pin output connector



Figure 7 – Fiber output connector

The polarity of the outputs is indicated by the '+' and '-' symbols on the back panel. TTL outputs are capable of driving 150 mA at 5 V and are galvanically isolated from power, logic, inputs and other outputs.

3 Power Supply Options

There are three different power supply options available for the ITD: low, medium or high voltage. Each of the power supplies feature a similar maximum output rating of 4 W, but have different isolation levels as detailed below. All three supplies are available as an orderable option.

Power Supply	Features
Low	14 – 36 Vdc Maximum 5 W, 2 kV Isolation
Medium	20 – 75 Vdc Maximum 5 W, 2 kV Isolation
AM IRIG-B	90 – 300 Vdc Maximum 5 W, 3.75 kV Isolation

Table 3 – ITD Available Power Supplies Modules

P1: Power Supply Connectors (2-pin [5.08 mm, screw lock])



Power is applied to the unit via a 2 pin, 5.08 mm, screw lock connector. Maximum steady state power consumption is 4 W, and surge protection is provided. A mating connector is supplied that is suitable for wiring up to 1.5 mm². The power supply has an internal fuse rated at 2 A, 300 Vac/dc in the positive supply, to protect the unit.

NOTE: The Power supply has polarity protection built in to prevent damage.

The power supply inputs are isolated from earth so that any earthing system is acceptable (PEN, positive earth, negative earth or non-earthed low voltage supply).

The input voltage range is marked on the option label that is attached to the ITD.

If the fuse blows, the unit should be returned for service as this is an unusual condition.



Check the identification label on the base of the unit to ensure that the correct output and voltage range has been supplied before proceeding to install.



The label on the base of ITD contains the voltage range: Do not apply power outside of this range.

4 Earth Stud (M4 Bolt and M4 Nut)



An M4 bolt is provided for earthing. This is located on the rear panel on the left side of the case.



The earth must be connected for regulatory compliance purposes.

5 Isolation & Protection

All outputs on the ITD are isolated from each other, the power supply and from earth.

Each modular output features at least 3 kV isolation from earth and has ESD suppression suitable for the interface type.

The power supply isolation varies from 2 kV for Low and Medium power supplies to 3 kV for the High power supply. In addition, a varistor protects the power supply against transverse voltages and transient suppressor diodes protect the internal electronics from longitudinal events.

Time-sensitive signaling paths use fixed delay, high speed optocoupler to keep timing delays consistent.

The TTL input (P2) has a varistor and diode clamp protection and uses resistors to limit the current to 2 mA at 5 V. The limiting voltage for the input is 18 V. The TTL outputs (P3 to P6) are each protected against damage from transverse voltage events via an auto-resetting fuse, and transient suppressor diode.

Fiber outputs and inputs use the inherent protection afforded by the fiber itself for protection.

6 Installation

Identification

Each ITD is shipped with an identification label on the base and side of the unit. The label provides details of the particular options fitted to the unit, the power supply requirement, the serial number and firmware revision.



The label indicates the type of output module: Do not apply voltages to output only interfaces and ensure that switch cards are connected appropriately.



The label contains the voltage range: Do not apply power outside of this range.

Connecting the ITD

The ITD has a five IO connectors and one power connector across the back. The connections from right to left are: power, one input (P2) and four outputs (P3 - P6). Any output connection not required may be left unterminated. The screw terminals are designed for stranded cables 0.14 – 1.5 mm² (25 – 16 AWG).

Mounting the Isolated Timing Distributer

The clock can be used free standing or mounted in a 19" rack. Each unit ships with a rack-mount bracket for this purpose.

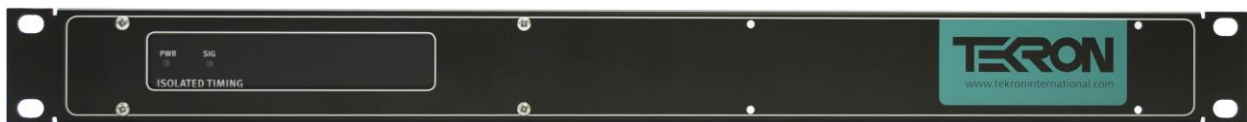


Figure 8 – Isolated Timing Distributer with rack-mount bracket

7 Appendix

ITD - Specifications

Physical Specifications		
Extruded aluminum case with 1.6 mm aluminum front and back panels		
Performance Property	Metric	
Dimensions	Width	160 mm
	Depth	155 mm
	Height	40 mm
Weight	800 g	
Inputs	1	
Outputs	4	
Input and Output Specifications		
Type / Property	Information	Port delay
TTL In		
Connector	MC 1,5/ 4-G-5,08	≤ 80 ns
Mates With	MC 1,5/ 4-ST-5,08	
Voltage	5 – 12 V 2.5 V switching	
Burden	2 mA	
TTL Out		
Connector	MC 1,5/ 2-G-5,08	≤ 100 ns
Mates With	MC 1,5/ 2-ST-5,08	
Voltage	5 V	
Drive	150 mA @ 4.5 V	
Fiber In ($\lambda = 820$ nm)	ST, $\lambda=820$ nm, -34 dBm sensitivity	≤ 70 ns
Fiber Out ($\lambda = 820$ nm)	ST, $\lambda=820$ nm, -19 dBm Optical Power	≤ 4 ns
Physical Specifications		
Performance Property	Metric	
Operating Temperature Range	-10 to 65 °C	
Electrical Specifications		
Performance Property	Electrical	Physical
Power Supply	Low Voltage	2 Pin + common earth
	Medium Voltage	
	High Voltage	
Power Drain	5 W max	
Isolation Physical Specifications		
Performance Property	Metric	
Power to IO (Low / Med power supply)	5.0 kV DC	
Power to IO (High power supply)	5.0 kV DC	
Power to Earth (Low / Med power supply)	2.0 kV DC	
Power to Earth (High power supply)	3.0 kV DC	
Input to Earth	3.5 kV AC	
Output to Earth	3.0 kV DC	

8 Warranty Statement

Tekron International Ltd (Tekron) warrants for a period of TEN years from the date of shipment that each Product supplied shall be free of defects in material and workmanship. During this period, if the customer experiences difficulty with a product and is unable to resolve the problem by phone with Tekron Technical Support, a Return Material Authorization (RMA) will be issued. Following receipt of an RMA number, the customer is responsible for returning the product to Tekron, freight prepaid. Tekron, upon verification of warranty will, at its option, repair or replace the product in question and return it to the customer, freight prepaid. No services are handled at the customer's site under this warranty.



Tekron shall have no obligation to make repairs, or to cause replacement required through normal wear and tear or necessitated in whole or in part by catastrophe, fault or negligence of the user, improper or unauthorized use of the Product, or use of the Product in such a manner for which it was not designed, or by causes external to the Product, such as, but not limited to, power or failure of building services.

A product will not be warranted if it is an accessory not carrying the Tekron brand name. In this case, warranties are limited to the warranty provided by the original manufacturer of the accessory. Examples of such products and accessories are antennas, cables, etc.

There are no understandings, agreements, representations or warranties, express or implied, including warranties of merchantability or fitness for a particular purpose, other than those specifically set out above or by any existing contract between the parties. Any such contract states the entire obligation of Tekron. The contents of this document shall not become part of or modify any prior or existing agreement, commitment or relationship.

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Warranty claims must be received by Tekron within the applicable warranty period. A replaced product, or part thereof, shall become the property of Tekron and shall be returned to Tekron at the Purchaser's expense.

A return material authorization number issued by Tekron must accompany all return material.

WARNING

This product has been designed to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against such interference when operating in a commercial environment.

Notes

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